



Kolloquium zur Masterarbeit

Yilin Guo

„A Hybrid Genetic Algorithm-Particle Swarm Optimization Approach for Fuel-efficient Truck Platooning“

Platooning is a term that refers to a series of trucks driving close to each other through a virtual link, with other trucks acting as the tails of the leading truck via semi-autonomous driving technology. In this case, all trucks may be required to deviate from their shortest path and take a detour in order to join a platoon, while their total fuel consumption will be reduced. Due to the high complexity of the FEP problem, a hybrid algorithm combining Genetic Algorithm (GA) and Particle Swarm Optimization (PSO) is proposed to solve it. The hybrid GA-PSO algorithm updates particles by using crossover and mutation operations in GA. To evaluate the performance of the hybrid GA-PSO algorithm, a graph of the road network is generated, which is partially based on the real German road network, including 21 major cities. The results of the hybrid GA-PSO algorithm are compared with the GA and PSO that have been applied to solve the FEP problem. The FEP problem has been solved in this study for up to 50 vehicles, and the results demonstrate that the hybrid GA-PSO algorithm performs well in solving the FEP problem. The average fuel saving percentage of the algorithm can reach 1.92% and 5.01% for the minimum 10 trucks and the maximum 50 trucks instances without considering the earliest departure time of the trucks. When the earliest departure time of the trucks is taken into account, the algorithm achieves an average fuel savings of 1.25% and 3.04%, respectively.

Freitag, 18. Februar 2022, 14:00 Uhr

Videokonferenz: BBB <https://webconf.tu-clausthal.de/b/mar-g85-skw-cpj>